



NSF Division of Astronomical Sciences (AST)

Report to HEPAP

December 1, 2016

Jim Ulvestad, Division Director

MPS/AST



AST Leadership

- NSF has opened search for a new Division Director, to replace current Division Director in autumn 2017
- Recruitment committee in place to help identify candidates
 - Roger Blandford, Joel Bregman, Debra Elmegreen, Lyman Page, Caty Pilachowski.
- See Dear Colleague Letters and the detailed job posting under Announcements at www.nsf.gov/ast
- Ralph Gaume started as Deputy Division Director on November 13.



Large Synoptic Survey Telescope

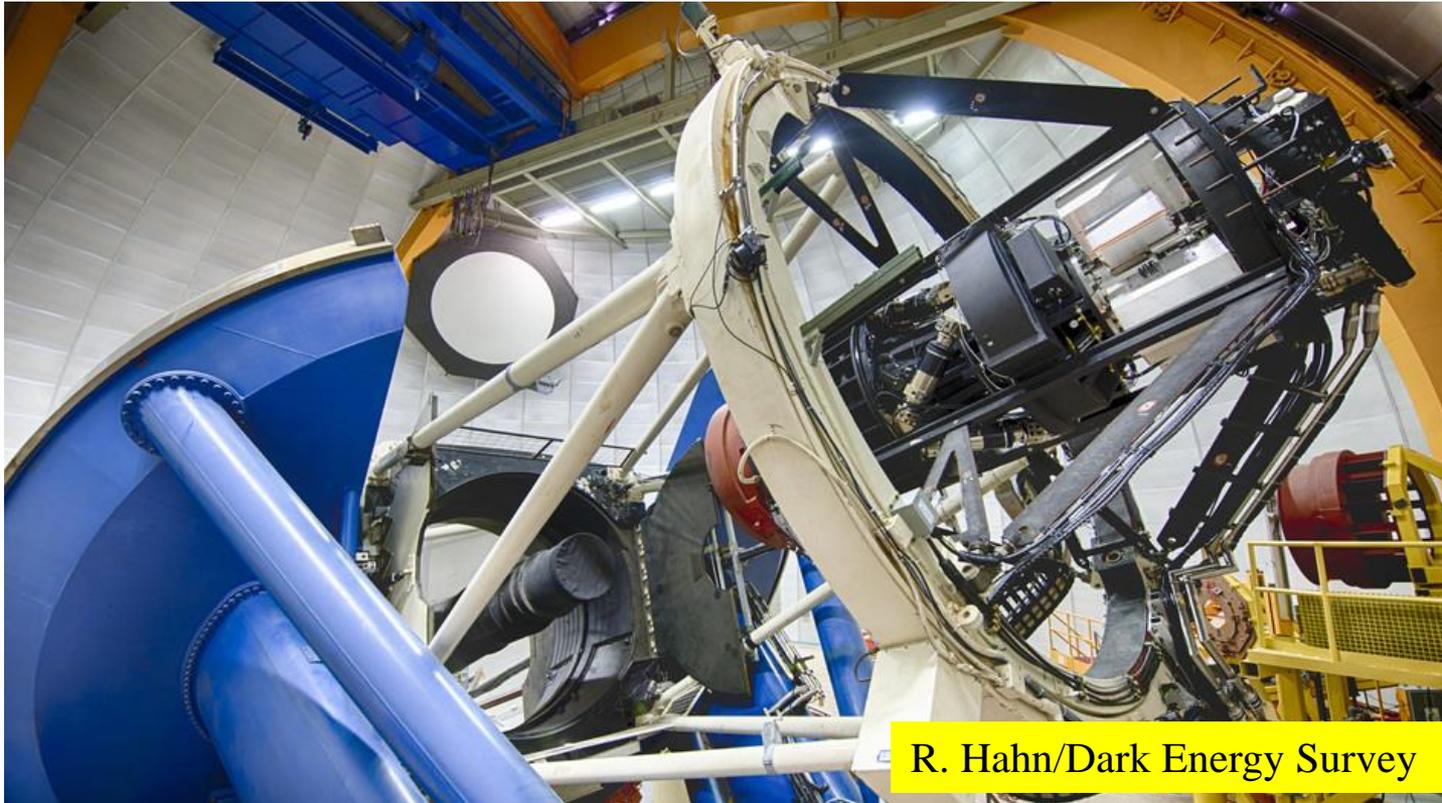
- NSF/DOE collaboration, with critical early private funding.
- NSF is lead on construction and operations.
- Expect operations proposal in 2017, for start in FY 2019.
- On track for late 2022 start date for 10-yr survey.



Top: Site construction progress
Bottom Right: Secondary mirror
figuring



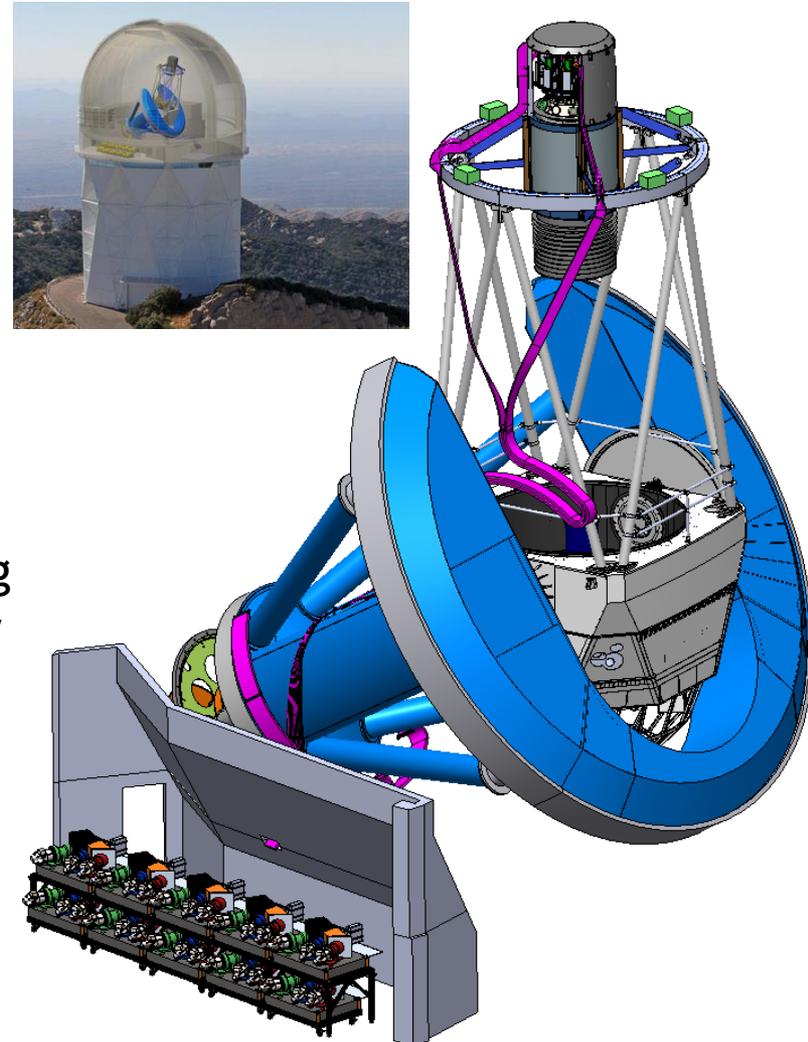
Blanco Telescope: Dark Energy Survey



- Joint NSF/DOE effort.
- DES is currently in the 4th year of a scheduled 5-year survey.
 - Weather losses much higher than anticipated.
- Many interesting scientific results in addition to Dark Energy.

Dark Energy Spectroscopic Instrument

- On NOAO Kitt Peak Mayall 4m, Arizona
- Commissioning complete June 2019
- 5-year Dark Energy experiment, 14,000 sq deg, >30M spectra
- Baryon Acoustic Oscillation technique
- DESI: 5000 fibers/robot positioners; 10 spectrographs; 8 square degree FOV
- Installation, Operations by NOAO on behalf of Science Collaboration; funded by DOE.
- NSF/NOAO largest supporter of DESI imaging surveys to support targeting: DECam Legacy Survey, Mayall z-band Legacy Survey (also non-NSF Beijing Arizona Sky Survey)
- NOAO Community Science Center supporting public release of all three image data sets; NOAO Data Lab supporting imaging catalog access/tools





Delivery of Science from Frontier Facilities

- AST pursuing divestment of lower priority facilities in order to retain program balance and enable operations and scientific exploitation from new observatories such as ALMA and LSST.
- *March 2016 AAAAC Recommendation: “Strong efforts by NSF for facility divestment should continue as fast as is practical. Efforts to explore partnerships, interagency cooperation and private resources to maintain some access to facilities for the US community that may mitigate the loss of open access should continue.”*
- *August 2016 NAS Mid-decadal review Recommendation 3-1: “National Science Foundation (NSF) should proceed with divestment from ground-based facilities which have a lower scientific impact, implementing the recommendations of the NSF [AST] Portfolio Review, that is essential to sustaining the scientific vitality of the U.S. ground-based astronomy program as new facilities come into operation.”*



LSST/NOAO Symposium Report

- August 2015: NSF wrote to the AURA President and the LSST and NOAO Directors endorsing the concept of a workshop/symposium that would consider and prioritize technical capabilities for the U.S. OIR System that are required to fully realize LSST-enabled science.
- October 2016: Report of the Kavli Futures Symposium “Maximizing Science in the Era of LSST: A Community-Based Study of Needed US OIR Capabilities”.
 - Considered six baseline science cases, and addressed prioritized needs and prospects for specific instrumental capabilities needed to address those science cases.



National Center for Optical-Infrared Astronomy (NCOA)

- NSF and AURA (managing organization) mutually agreed to reorganizing NSF-funded nighttime OIR observatories into a single administrative organization serving as the U.S. national center for ground-based OIR astronomy.
- Major benefits envisioned are the provision of enhanced science return when LSST operations commence, and the potential for operations cost savings.
- September 2016: NSF provided guidance to AURA to develop NCOA as the administrative framework for operations of all OIR observatories while respecting all partner agreements.
- June 2017: AURA delivers to NSF a Plan for NCOA Organization, Management and Operation, as well as a Transition/Implementation Plan.
- Note: LSST construction will remain separate from NCOA.



CMB-S4

- AAAC Recommendation: “We encourage DOE, NSF, and university community to continue working toward a plan for a future (Stage 4) ground-based CMB experiment.”
- In October, NSF and DOE charged AAAC to form a subcommittee to develop a strawman project concept for agencies’ planning purposes. Subcommittee now formed, chaired by Charles Lawrence (JPL).
- P5 recommended CMB-S4 as a strategic initiative, but this was not an Astronomy & Astrophysics decadal survey recommendation.
- NSF currently plans to evaluate CMB-S4 funding within established core programs.



Existing AST-funded CMB Activities

- NSF has funded the key ground-based CMB developments for decades.
- Currently five ongoing CMB projects funded by NSF.
 - Advanced ACTPOL, Polarbear/Simons Array, CLASS, BICEP, South Pole Telescope.



ACT + Polarbear



CLASS